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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/007,299	11/08/2001	Giovanni B. Marchisio	480193.402	5356

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EXAMINER	
SKED, MATTHEW J	

ART UNIT	PAPER NUMBER
2626	

DATE MAILED: 04/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/007,299	MARCHISIO ET AL.	
	Examiner	Art Unit	
	Matthew J. Sked	2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 January 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *2-13,15-38,40-49,81-106 and 119-141* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *2-13,15-38,40-49,81-106 and 119-141* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. The rejection of claim 81 under 35 USC 112 is withdrawn in view of the amendment filed 1/19/06.

2. Applicant's arguments with respect to claims 2-13, 15-38, 40-49, and 81-106 have been considered but are moot in view of the new ground(s) of rejection.

3. Claims 14, 39, 50-80 and 107-118 have been canceled.

4. Claims 119-141 have been newly added.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 2-13, 15-23, 25, 26-38, 40-49, 81, 82, 84-87, 95-97, 101-103, 119-137 and 139 are rejected under 35 U.S.C. 102(e) as being anticipated by Tsourikov et al. (U.S. Pat. Pub. 2002/0010574A1).

As per claims 2, 26, and 27, Tsourikov teaches a method, computer-readable medium and a syntactic query engine in a computer system for transforming a

document of a data set into a canonical representation, the document having a plurality of sentences, each sentence having a plurality of terms, comprising:

for each sentence, parsing the sentence to generate a parse structure having a plurality of syntactic elements (part-of-speech tagging and parsing, Fig. 4, elements 36 and 38);

determining a set of meaningful terms of the sentence from the syntactic elements (detects introductory words and excludes them hence the remaining words are meaningful, paragraphs 93-104);

determining from the structure of the parse structure and the syntactic elements a grammatical role for each meaningful term in the set of meaningful terms, wherein the grammatical role is a verb (eSAO extraction extracts the action, paragraphs 191-201 and 282-289);

determining an additional grammatical role for at least one of the meaningful terms, such that the at least one meaningful term is associated with at least two different grammatical roles, wherein the additional grammatical role indicates that the at least one of the meaningful terms is an object (determines multiple sets of fields and therefore determines additional grammatical roles of the terms, wherein this additional role is an object, paragraphs 268-289); and

storing in an enhanced data representation data structure a representation of each association between a meaningful term and its determined grammatical roles, in a manner that indicates a grammatical relationship between a plurality of the meaningful terms and such that at least one meaningful term is associated with a plurality of

grammatical relationships (stores the eSAO structure in memory for searching, paragraph 426).

7. As per claims 3, 28 and 122, Tsourikov teaches wherein heuristics are used to determine the additional grammatical role for the at least one of the meaningful terms (eSAO uses models that describe rules, paragraphs 191-201).

8. As per claims 4-10, 29-35 and 123-129, Tsourikov teaches that multiple sets of fields are possible for any given input hence suggesting that any combination of rules that are claimed would be possible (paragraphs 268-289).

9. As per claims 11, 36 and 130, Tsourikov teaches wherein the determined additional grammatical role is a part of grammar that is not implied by the position of the at least one meaningful term relative to the structure of the sentence (additional role not implied by the position, paragraphs 268-289).

10. As per claims 12, 37 and 131, Tsourikov teaches wherein heuristics are used to determine which grammatical relationships are to be stored in the enhanced data representation data structure (algorithms control which relations to extract from the document, paragraph 204).

11. As per claims 13, 38 and 132, Tsourikov teaches wherein the determining the grammatical role for each meaningful term and the determining of the additional grammatical role for at least one of the meaningful terms yields a plurality of grammatical relationships between meaningful terms that are identical (after both sets of roles are extracted many fields are empty hence the relationships are identical and redundant, paragraphs 268-289).

12. As per claims 15, 40 and 133, Tsourikov teaches wherein the document is part of a corpus of heterogeneous documents (source documents, paragraph 426).

13. As per claims 16, 41 and 134, Tsourikov teaches wherein the enhanced data representation data structure is used to index a corpus of documents (Fig. 8, element 90).

14. As per claims 17, 42 and 135, Tsourikov teaches wherein the enhanced data representation data structure is used to execute a query against objects in a corpus of documents (Fig. 8, element 94).

15. As per claims 18, 43 and 136, Tsourikov teaches wherein the enhance data representation data structure corresponds to the query and results are returned that satisfy the query when an object in the corpus contains similar terms associated with similar grammatical roles to the terms and their associated roles as stored in the enhanced data representation that corresponds to the query (identifies the eSAO structures of the source documents that match the eSAO search patterns of the query, paragraph 426).

16. As per claims 19 and 44, Tsourikov teaches wherein the objects in the corpus are sentences and indications of sentences that satisfy the query are returned (objects are sentences and returns full source sentence to the user, paragraphs 211-218 and 426).

17. As per claims 20 and 45, Tsourikov teaches returning indications of documents that contain similar terms to those found in at least one sentence that was indicated in

the results returned that satisfied the query (returns link to the full source document, paragraph 426).

18. As per claims 21 and 46, Tsourikov teaches returning indications of documents that contain similar terms to those found in at least one document that was indicated in the results returned that satisfied the query (returns link to the full source document, paragraph 426).

19. As per claims 22 and 47. Tsourikov teaches the enhanced data structure corresponds to the query and terms that are associated with designated grammatical roles are returned for each object in the corpus that contains similar terms associated with similar grammatical roles to the terms and associated roles of designated relationships from the enhanced data representation data structure that corresponds to the query (displays the structures to the user, paragraph 426).

20. As per claims 23, 48 and 139, Tsourikov teaches adding additional grammatical relationships to the enhanced data representation structure to be used to execute the query against objects in a corpus of documents (forms less relevant search patterns, paragraphs 404-425).

21. As per claims 25, 49 and 137, Tsourikov teaches wherein weighted results that satisfy the query are returned (returns results in order of relevance, paragraph 426).

22. As per claims 81, 85 and 86, Tsourikov teaches a method, computer readable medium in a computer system for storing a normalized data structure representing a document of a data set, the document having a plurality of sentences, each sentence having a plurality of terms, comprising:

for each sentence, determining a set of meaningful terms of the sentence and at least one grammatical role for each meaningful term (detects introductory words and excludes them and then the grammatical words of the remaining words are extracted, paragraphs 93-104 and 191-201); and

storing sets of grammatical relationships between a plurality of meaningful terms based upon the determined grammatical role of each meaningful term relative to a meaningful term that is being used as a governing verb, wherein, for each meaningful term that is being used as a governing verb, the normalized data structure contains a set of meaningful terms that are subjects relative to the governing verb, a set of meaningful terms that are objects relative to the governing verb, and at least one of a set of meaningful terms that are verb modifiers of prepositional phrases that contain the governing verb and a set of meaningful terms that are noun modifiers of noun phrases that relate to the governing verb (eSAO structure contains the action and the associated subject, object, preposition, adjective, and adverbial associated with it, paragraphs 210-218).

23. As per claims 82 and 87, Tsourikov teaches stroring meaningful terms that correspond to a designated attribute (stores constraints, paragraphs 228-266).

24. As per claim 84, Tsourikov teaches a data processing system comprising a computer processor and a memory, the memory containing structured data that stores a normalized representation of sentence data, the structured data being manipulated by the computer processor under the control of program code and stored in the memory as:

a subject table having a set of meaningful term pairs, each pair having a meaningful term that is associated with a grammatical role of a verb and a meaningful term that is associated with a grammatical role of a subject relative to the verb (subject stored and associated with the action, paragraphs 211-218);

object table having a set of meaningful term pairs, each pair having a meaningful term that is associated with a grammatical role of a verb and a meaningful term that is associated with a grammatical role of an object relative to the verb (object stored and associated with the action, paragraphs 211-218);

a representation of associations between the subject and the object, the representation indicating, for each meaningful term associated with the grammatical role of the verb, the meaningful terms that are associated with the grammatical role of subject relative to the verb and the meaningful terms that are associated with the grammatical role of object relative to the verb (subject and object related by being stored together in the structure, paragraphs 211-218);

a preposition table having a set of meaningful term groups, each group having a meaningful term that is associated with a grammatical role of a preposition relative to the verb, and a meaningful term that is associated with a grammatical role of a verb modifier relative to the verb (preposition stored and associated with the action, paragraphs 219-227); and

a noun modifier table having a set of meaningful term pairs, each pair having a meaningful term that is associated with a grammatical role of a noun and a meaningful

term that is associated with a grammatical role of an noun modifier relative to the noun (adjective stored and associated with the noun, paragraphs 219-227).

25. As per claims 95 and 101, Tsourikov teaches wherein the returned indications of sentences are indications of paragraphs (displays associated paragraph, paragraph 426).

26. As per claims 96 and 102, Tsourikov teaches wherein the returned indications of sentences are indications of documents (sentences includes link to document, paragraph 426).

27. As per claims 97 and 103, Tsourikov teaches wherein the at least one sentence that was indicated in the result is a paragraph (displays associated paragraph, paragraph 426).

28. As per claim 119, Tsourikov teaches wherein an enhanced data representation data structure is generated for a plurality of sentences of each document in a corpus of documents as part of indexing the corpus, and further comprising:

receiving a query that specifies only a portion of a grammatical relationship between two terms, the portion being a specification of the relationship of a specification of one of the two terms but not both terms (question queries ignore the question words hence only specifying the other terms in the query, paragraphs 230-232 and 368-378);

transforming the query into an enhanced data representation data structure (paragraphs 368-378); and

comparing the enhanced data representation data structure of the query against the enhanced data representation data structures of each indexed sentence such that

indications of sentences are returned as matches when the enhanced data representation data structure of the query matches at least one of the enhance data representation data structures of the indexed sentence by using a wildcard to match unspecified information in the grammatical relationship indicated by the enhanced data representation data structure of the query (searches for a relevant eSAO structure corresponding the query structure and uses the term "any" in fields as a wildcard, paragraphs 368-378 and 426).

29. As per claim 120, Tsourikov teaches wherein the query specifies only an action (a bit sentence with only an action would have a query structure with only an action, paragraphs 336-356).

30. As per claim 121, Tsourikov teaches wherein the query specifies a single term as either a subject or an object, and the method returns a matching result when the term appears in an enhanced data representation data structure of an indexed sentence as an object or as a subject (single object term that would return documents with structures with objects that match the object term, paragraphs 336-347 and 426).

31. As per claims 138 and 141, Tsourikov teaches wherein the query processor associates a wildcard with the query to generate results that satisfy the query (incorporates the term "any" in the query to generate results that satisfy that query, paragraphs 336-356 and 426).

Claim Rejections - 35 USC § 103

32. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

33. Claims 24, 83, 88, 98-100, 104-106 and 140 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsourikov in view of Official Notice.

As per claims 24 and 140, Tsourikov does not teach wherein at least one of entailed verbs or related verbs are used to add additional grammatical relationships.

However, the Examiner takes Official Notice that incorporating synonyms of terms in a search query is well known. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to modify the system of Tsourikov to add additional grammatical relationships by using related verbs because it would increase the amount of relevant documents returned.

34. As per claims 83 and 88, Tsourikov does not teach wherein the designated attribute is at least one of country name, name, date, money, amount, number, location, person, corporate name and organization.

However, the Examiner takes Official Notice that storing terms corresponding to proper names for document retrieval is notoriously well known in the art. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to modify the system of Tsourikov to store terms corresponding to proper names because

it would allow the system to retrieve queries containing out of dictionary terms hence giving better query results.

35. As per claims 98-100 and 104-106, Tsourikov does not teach wherein the indications of documents that contain similar terms are determined by using latent semantic regression techniques.

However, the Examiner takes Official Notice that using regression models in the Latent Semantic Indexing of documents is well known. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to modify the system of Tsourikov to use latent semantic regression techniques because it will locate synonymous words hence improving searching.

36. Claims 89-94 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsourikov in view of Arnold et al. (U.S. Pat. 6,910,003).

Tsourikov teaches a method, computer-readable memory and a query engine in a computer system for transforming an object of a data set into a canonical representation for use in indexing the objects of the data set and in querying the data set and having a plurality of units that are specified according to an object-specific grammar, comprising:

for each object, decomposing the object to generate a parse structure having a plurality of syntactic elements (part-of-speech tagging and parsing, Fig. 4, elements 36 and 38);

determining a set of meaningful units of the object from these syntactic elements (detects introductory words and excludes them hence the remaining words are meaningful, paragraphs 93-104);

determining from the structure of the parse structure and the syntactic elements a grammatical role for each meaningful unit (eSAO extraction extracts the grammatical roles from the input, paragraphs 191-201 and 282-289);and

storing in an enhanced data representation data structure a representation of each meaningful unit associated with its determined grammatical role, in a manner that indicates a grammatical relationship between a plurality of the meaningful units (stores each word with its indexes (stores the eSAO structure in memory for searching, paragraph 426).

Tsourikov does not teach the object being other than a text-only document, such as audio, video and images.

Arnold teaches a system for indexing and searching a plurality of documents found on the web, which would include html information (which would include images), speech, video and audio (col. 5, lines 59-65).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify the system of Tsourikov to index objects other than text-only documents as taught by Arnold because it would allow multimedia documents to be indexed and retrieved hence making a more useful system.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew J. Sked whose telephone number is (571) 272-7627. The examiner can normally be reached on Mon-Fri (8:00 am - 4:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Hudspeth can be reached on (571) 272-7843. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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04/13/06

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